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This listing of claims will replace all prior versions, and listings, of claims in the application:

1   Claim 1 (previously presented): A multi-tone signal
2   communications method for communicating information using
3   N tones, where N is a positive integer greater than one,
4   the method comprising:
5   generating N analog signals, each one of the N
6   analog signals corresponding to a different one of the N
7   tones, wherein each of the N analog signals includes a
8   periodic signal representing a symbol to be transmitted
9   during said symbol transmission period;
10   separately generating N signal prefixes, one
11   signal prefix being generated for each one of the N
12   analog signals from the one of the N periodic signals
13   included in the corresponding one of the N analog
14   signals, each of the N signal prefixes including multiple
15   parts and wherein the step of separately generating N
16   signal prefixes includes, for each one of the N analog
17   signals:
18   i) generating a first cyclic prefix part from the
19   included periodic signal representing the current symbol;
20   and
21   ii) generating a second prefix part from the
22   included periodic signal representing the preceding
23   symbol and from the first cyclic prefix part; and
24   transmitting the N analog signals into a
25   communications channel using M antennas, where M is an
26   integer and where $1 < M \leq N$.

1   Claim 2 (original): The method of claim 1, wherein $M=N$.

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1 Claim 3 (original): The method of claim 1, further
2 comprising the step of:
3   separately amplifying each of the N analog
4 signals prior to transmitting said N analog signals.

1 Claim 4 (previously presented): The method of claim 3,
2 wherein each of said N analog signals has a duration
3 corresponding to at least a symbol transmission period.

1 Claim 5 (original): The method of claim 4, wherein the N
2 periodic signals and signal prefixes are generated in the
3 passband.

1 Claim 6 (previously presented): The method cf claim 4,
2   wherein each of the N analog signals has a
3 duration corresponding to multiple symbol transmission
4 periods.

Claim 7 (canceled)

1   Claim 8 (previously presented): The method of claim 1,
2   wherein the step of generating a second prefix part
3   includes cyclically extending the periodic signal
4   representing the included preceding symbol and cyclically
5   extending the first cyclic prefix part to correspond to
6   the same time period; and
7   combining and attenuating the cyclically
8   extended portion of the first cyclic prefix part and the
9   cyclically extended portion to the included periodic
10 signal representing the preceding symbol.

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1   Claim 9 (previously presented): A multi-tone signal
2   communications method for communicating information using
3   N tones, where N is a positive integer greater than one,
4   the method comprising:
5   generating N analog signals, each one of the N
6   analog signals corresponding to a different one of the N
7   tones and wherein each of said N analog signals has a
8   duration corresponding to at least a symbol transmission
9   period and wherein each of the N analog signals includes
10   a periodic signal representing a symbol to be transmitted
11   during said symbol transmission period;
12   separately generating N signal prefixes, one
13   signal prefix being generated for each one of the N
14   analog signals from the one of the N periodic signals
15   included in the corresponding one of the N analog
16   signals;
17   separately amplifying each of the N analog
18   signals prior to transmitting said N analog signals; and
19   transmitting the N analog signals into a
20   communications channel using M antennas, where M is an
21   integer and where $1 < M \leq N$,
22   wherein each of the N signal prefixes includes
23   multiple parts and wherein the step of separately
24   generating N signal prefixes includes, for each one of
25   the N analog signals:
26   generating a first cyclic prefix part from the
27   included periodic signal representing the current symbol;
28   and

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29   generating a second prefix part to be a
30 periodic signal, the beginning of the generated second
31 prefix part having the same phase as the end of the
32 periodic signal representing the preceding symbol and the
33 end of the generated second prefix part having the same
34 phase as the beginning of the first cyclic prefix part.

1   Claim 10 (original): The method of claim 6, wherein each
2   of the N periodic signals is a sinusoidal wave.

1   Claim 11 (original): The method of claim 6, wherein each
2   of the N periodic signals is a square wave.

1   Claim 12 (previously presented): A multi-tone signal
2   communications method for communicating information using
3   N tones, where N is a positive integer greater than one,
4   the method comprising:
5   generating in parallel, for each one of the N
6   tones, a separate periodic signal including at least one
7   high order harmonic signal component that is different
8   from the fundamental frequency signal component of said
9   tone, wherein the generated periodic signal includes a
10 square wave; and
11   transmitting the generated N periodic signals
12 into a communications channel.

1   Claim 13 (original): The method of claim 12, wherein the
2   periodic signal generated for each of the N tones,
3   includes multiple high order harmonic signal components.

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Claim 14 (canceled)

1 Claim 15 (original): The method of claim 12, further
2 comprising:
3   generating, in parallel, for each one of the N
4 tones, a separate periodic signal prefix.

1 Claim 16 (original): The method of claim 15, wherein the
2 step of generating a separate periodic signal prefix for
3 each one of the N tones includes, for each one of the N
4 generated prefixes:
5   generating a cyclic prefix portion; and
6   generating a continuity signal portion, the
7 continuity signal portion being generated as a function
8 of a previously generated periodic signal and the current
9 generated periodic signal.

1 Claim 17 (original): The method of claim 15, further
2 comprising, for each one of the N tones, combining in the
3 passband, the periodic signal corresponding to the one of
4 the N tones with the corresponding one of the N periodic
5 signal prefixes.

1 Claim 18 (previously presented): A multi-tone signal
2 communications method for communicating information using
3 at least N tones, where N is a positive integer greater
4 than one, the method comprising:
5   separately generating, for each one of the N
6 tones, a passband periodic signal representing a symbol,
7 at least some of the N generated passband periodic

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8   signals include a high order harmonic signal component in
9   addition to a fundamental frequency signal component, the
10   high order harmonic signal component having a frequency
11   which is higher than the frequency of the fundamental
12   signal component; and
13   transmitting the N generated passband periodic
14   signals.

1   Claim 19 (original): The method of claim 18, wherein the
2   passband periodic signals for each one of. the N tones are
3   generated in parallel; and
4   wherein the step of transmitting the N
5   generated passband periodic signals includes broadcasting
6   different ones of said N passband periodic signals using
7   different antennas.

1   Claim 20 (original): The method of claim 18, comprising:
2   combining at least some of the N generated
3   passband periodic signals prior to transmission.

     Claim 21 (canceled)

1   Claim 22 (previously presented): The method of claim 18,
2   wherein each of the N generated periodic signals is a
3   square wave.

1   Claim 23 (original): The method of claim 18, further
2   comprising:
3   generating, a separate prefix for each of the N
4   generated passband periodic signals; and

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5   combining, prior to transmission, each one of

6   the separate prefixes with the corresponding one of the N

7   generated passband periodic signals.

1   Claim 24 (original): The method of claim 23, wherein the

2   prefixes for each of the N passband periodic signals are

3   generated in parallel.

1   Claim 25 (original): The method of claim 23, wherein the

2   step of combining each one of the separate prefixes with

3   the corresponding one of the N generated passband

4   periodic signals includes:

5   prepending the generated prefix to the

6   corresponding one of the N generated passbanc periodic

7   signals.

1   Claim 26 (original): The method of claim 23, wherein

2   generating a separate prefix for each of the N generated

3   passband periodic signals includes, for each separate

4   prefix:

5   generating a first cyclic prefix part; and

6   generating a second prefix part, the second prefix

7   part being generated using a different generation

8   technique than the first prefix part.

1   Claim 27 (original): A periodic signal processing

2   method, the method comprising:

3   generating a multi-part prefix from a first

4   periodic signal, the step of generating a multi-part

5   prefix from the first periodic signal including:

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6   performing a cyclic extension operation on the
7   first periodic signal to generate a cyclic prefix
8   portion;

9   generating a continuity prefix portion;
10   and
11   appending the cyclic prefix portion to the
12   end of the continuity prefix portion.

1   Claim 28 (original): The method of claim 27, wherein
2   generating a continuity prefix portion includes:
3   processing the cyclic prefix portion to
4   generate the continuity prefix portion from the cyclic
5   prefix portion.

1   Claim 29 (currently amended): The method of claim 27 ~~28~~,
2   wherein generating a continuity prefix portion includes:
3   processing a preceding periodic signal to
4   generate the continuity prefix portion from the preceding
5   periodic signal.

1   Claim 30 (original): The method of claim 27, wherein
2   generating a continuity prefix portion includes:
3   processing the cyclic prefix portion and a
4   preceding periodic signal to generate the continuity
5   prefix portion from both the cyclic prefix portion and
6   the preceding periodic signal.

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1 Claim 31 (original): The method of claim 30, wherein
2 said processing of the cyclic prefix portion and a
3 preceding periodic signal includes:
4   performing a cyclic extension operation on the
5 cyclic prefix portion to generate a first cyclic
6 extension;
7   performing another cyclic extension operation
8 on the preceding periodic signal to generate a second
9 cyclic extension, the first and second cyclic extensions
10 corresponding to a signal time period which is the same
11 for both the first and second cyclic extensions; and
12   combining the first and second cyclic
13 extensions corresponding to said signal time period to
14 generate said continuity prefix portion, the step of
15 combining the first and second cyclic extensions
16 including:
17   windowing the combined cyclic extensions
18   using an attenuating window.

1 Claim 32 (original): The method of claim 31, wherein
2 each of said cyclic extension operations includes copying
3 a portion of the signal upon which said cyclic extension
4 operation is performed.

1 Claim 33 (previously presented): The method of claim 27,
2 wherein the continuity prefix portion has a frequency
3 which is different from the frequency of the first
4 periodic signal but has a phase at the point where the
5 cyclic prefix portion is appended to the continuity

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6 prefix portion that is the same as the phase of the

7 beginning of the cyclic prefix portion.

1 Claim 34 (previously presented): The method of claim 27,

2 wherein the continuity prefix portion has a phase at the

3 beginning of the continuity prefix portion that is the

4 same as the phase of the end of a preceding periodic

5 signal.

1 Claim 35 (original): The method of claim 27, wherein the

2 first periodic signal is one of N period signals

3 corresponding to N different tones of a multi-tone

4 signal, where N is a positive integer greater than one,

5 the method further comprising:

6   generating for each of the N periodic signals,

7 other than the first periodic signal, a separate

8 multi-part prefix from a corresponding one of the N

9 periodic signals, thereby generating N-1 multi-part

10 signal prefixes in addition to the multi-part prefix

11 generated from the first periodic signal.

1 Claim 36 (original): The method of claim 35, further

2 comprising:

3   prepending each of the generated N-1 multi-part

4 prefixes and the generated multi-part prefix generated

5 from the first periodic signal to the corresponding ones

6 of the N periodic signals from which the multi-part

7 prefixes were generated.

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1   Claim 37 (original): The method of claim 36, further
2   comprising the step of:
3   filtering each of the N periodic signals with
4   prepended multi-part prefixes in parallel; and
5   transmitting the filtered N periodic signals
6   with prepended multi-part prefixes into a communications
7   channel.

1   Claim 38 (original): The method of claim 37, wherein the
2   step of transmitting the filtered N periodic signals with
3   prepended multi-part prefixes includes broadcasting
4   different ones of the N periodic signals using different
5   antennas.

1   Claim 39 (original): The method of claim 38, further
2   comprising:
3   allowing the N broadcast periodic signals to
4   combine in the communications channel to form an N tone
5   OFDM signal.

Claim 40 (canceled)

1   Claim 41 (currently amended): A method of sequentially
2   transmitting symbols in a multi-tone signal communication
3   system using N tones per symbol period, wherein the N
4   tones remain the same for multiple symbol periods, the
5   time period in which the N tones remain the same being a
6   dwell, the method comprising:
7   for each symbol transmission period of the
8   dwell:

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9   rotating a constellation of symbols from

10   which consecutive symbols are transmitted using

11   one of said N tones by a fixed amount ~~and~~ which

12   is a function of the duration of a multi-part

13   prefix to be transmitted and ~~with the selected~~

14   ~~symbol, wherein said fixed amount by which the~~

15   ~~constellation of symbols is rotated is a~~

16   ~~function of~~ the tone frequency used;

17   selecting a symbol to be transmitted from

18   a constellation of symbols to be transmitted

19   using a signal corresponding to one of said N

20   tones; and

21   transmitting N signals corresponding to

22   each one of the N tones of the multi-tone

23   signal, each one of the N signals being

24   transmitted on a corresponding one of a first

25   plurality of antennas, the antenna being used

26   to transmit signals corresponding to a

27   particular tone during the dwell remaining the

28   same throughout the dwell.

1   Claim 42 (original): The method of claim 41, further

2   comprising the step of:

3   for each symbol transmission period of a second

4   dwell:

5   transmitting N signals corresponding to

6   each one of the N tones of the multi-tone

7   signal, each one of the N signals being

8   transmitted on a corresponding one of a second

9   plurality of antennas, the antenna being used

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10   to transmit signals corresponding to a
11   particular tone during the second dwell
12   remaining the same throughout the second dwell,
13   the second plurality of antennas including at
14   least one antenna which is different from the
15   antennas included the first plurality of
16   antennas.

Claim 43 (canceled)

1   Claim 44 (previously presented): The method of claim 41,
2   wherein the rotation of the constellation during each of
3   the plurality of symbol transmission period has a
4   cumulative rotational effect on the constellation from
5   which symbols are selected causing the rotation of the
6   symbols in one symbol transmission period to effect the
7   constellation from which symbols are selectec during the
8   next symbol transmission period.

1   Claim 45 (previously presented): The method of claim 41,
2   wherein the rotation of the constellation during each of
3   the plurality of symbol transmission periods is by a
4   fixed additive amount which does not effect the position
5   of the symbols in the constellation from which the next
6   symbol is selected.

Claims 46-50 (canceled)

1   Claim 51 (previously presented): A system for generating
2   and transmitting signals corresponding to an N tone

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3   multi-tone signal, where N is a positive integer greater

4   than 1, the system comprising:

5   N periodic signal generator circuits for

6   generating periodic signals, each periodic signal

7   corresponding to a different tone one of the N tones of

8   the multi-tone signal, wherein each of the N periodic

9   signal generator circuits includes a square wave

10 generator, each one of said N periodic signals including

11 a square wave having a frequency component corresponding

12 to one of said N tones of the multi-tone signal; and

13   N prefix generator circuits for independently

14 generating periodic signal prefixes, each one of the N

15 prefix generator circuits being coupled to a different

16 corresponding one of the N periodic generator circuits.

1   Claim 52 (original): The system of claim 51, further

2   comprising:

3   N filters for independently filtering the N

4   periodic signals including prefixes generated by the N

5   prefix generator circuits, each one of the N filters

6   being coupled to a different corresponding one of the N

7   prefix generator circuits.

1   Claim 53 (original): The system of claim 52, further

2   comprising:

3   a plurality of M antennas, where M is an

4   integer and where $1 < M \leq N$, each of the N filters being

5   coupled to a single one of the M antennas and each one of

6   the M antennas being coupled to at least one of the N

7   filters.

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1   Claim 54 (original): The system of claim 53, wherein M =
2   N.

1   Claim 55 (original): The system of claim 54, wherein M <
2   N, the system further comprising, at least one analog
3   combing circuit for combining signals from a subset of
4   said N filters into a signal filter and for coupling each
5   filter in the subset of said N filters one of said M
6   antennas.

     Claim 56 (canceled)

1   Claim 57 (original): The system of claim 51, wherein
2   each of the N prefix generator circuits generates a
3   separate prefix, each one of the N separate prefixes
4   having the same duration.

1   Claim 58-59 (canceled)

1   Claim 60 (new): An communications apparatus, comprising:
2   a periodic signal generator module for
3   generating a first periodic signal; and
4   a prefix generation module including:
5   means for generating a multi-
6   part prefix from a first periodic signal
7   by performing a cyclic extension operation
8   on the first periodic signal to generate a
9   cyclic prefix portion, generating a
10   continuity prefix portion; and appending

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11   the cyclic prefix portion to the end of

12   the continuity prefix portion.

1   Claim 61 (new): The apparatus of claim 60, wherein said

2   means for generating a multi-part prefix includes:

3   means for processing the cyclic prefix portion to

4   generate the continuity prefix portion from the cyclic

5   prefix portion.

Claim 60 (new): The apparatus of claim 60, wherein said
means for generating a multi-part prefix includes:
       means for processing a preceding periodic
signal to generate the continuity prefix portion from the
preceding periodic signal.

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